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ABSTRACT

This pamphlet outlines control measures for disease and insect infestation of ornamentals and turfgrass. Hosts are identified with comments on rates and times of pesticide application for greatest effect. Other sections of the document deal with aquatic and terrestrial weed control in a similar manner. (CS)

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Extension Bulletin E-944 Revised March 1977

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PESTICIDES for ornamentals

Commercial Recommendations for 1977

for nurseries, garden centers, parks, roadsides

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CONTENTS

1. *Disease Control for Trees and Shrubs* 3
2. *Disease Control for Turfgrasses* 5
3. *Insect Control for Trees, Shrubs and Flowers* 6
4. *Insect Control for Turfgrasses* 6
5. *Mosquito Control* 7
6. *Nematode Control* 8
7. *Weed Control for Ornamentals* 10
8. *Weed Control for Roadsides and Ditches* 11
9. *Weed Control in Turf* 12
10. *Aquatic Weed Control* 12

SE 024 015

COOPERATIVE EXTENSION SERVICE — MICHIGAN STATE UNIVERSITY

IMPORTANT NOTICE

The Federal Environmental Pesticide Control Act (FEPCA) now in force states that the use of ***any pesticide inconsistent with the instructions on the container label is illegal****, except when special regulations allow its use at a lower rate than the label recommendations. Hence, persons using a pesticide should familiarize themselves with the label information, as they assume full responsibility for its proper use.*

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1. Disease Control for Trees and Shrubs

Prepared By Franklin Laemmlen

Host	Disease	Material per 100 gallon water	Comments
Ash, Maple, Oak	Anthracnose	Dodine 1½ lb; Captan. 2 lb, Zineb 2 lb	Apply at bud break with a second and third application made at 10-day intervals if average temperatures are below 55°F. Recommended for young trees only.
Crab apple Hawthorn Mountain ash	Scab, other leafspots	Mancozeb, 1½ lb (80%); Captan, 2 lb; Dodine, ½ lb; Benomyl, ½ lb; Folpet (75%), 1 lb	2-4 sprays applied at green tip and at 10-14 days through July.
Cotoneaster, Japanese quince, Mountain ash Hawthorn, Spirea, Flowering crab, or Pear	Fireblight	Streptomycin (50-100 ppm); Bordeaux mixture, 2-6-100	Apply first at pink bud and at 7-14 days until dry weather or shoot elongation stops. Prune out cankered limbs in winter only.
Dogwood	Anthracnose	Benomyl, ½ lb; Mancozeb, 1½ lb (80%)	As needed starting at bud break. Apply at 7- to 14-day intervals.
Douglas fir	Swiss Needlecast	Maneb. 2½ lb; Mancozeb, 2½ lb Benomyl, 1 lb	Begin about May 31 (3-4) to early August at 21-day intervals (thorough wetting of the tree is important).
Douglas fir	Rhabdocline Needlecast	Benomyl, 1 lb	Apply on same schedule as for swiss needlecast control.
Elm	Black Leaf spot	Dichlone, 1 lb; Zineb, 2 lb; Ferbam, 2 lb; Bordeaux, 4-4-100; Mancozeb, 2 lb	Apply 3 sprays beginning in mid-May at 14-21 day intervals. Destroy diseased leaves in Fall.
Elm	Dutch elm	Benomyl, 2 lb	Remove diseased trees. Apply in spring when trees approach full leaf. Injection or foliar spray may be used. Recommended for preventative use only.
		MBC-P (lignasan-BLP), 1 qt. per 8 gals. water	Apply 1 gal. per injection site in spring when trees are ½ to near full leaf.
Flowering peach	Leaf curl	Bordeaux (4-3-100); Lime sulfur (liquid) 8 gal	Apply while trees are dormant.
Garden beds	Root rots, nematodes, insects	Ethylene dibromide (capsule), 15 in apart and 5 in deep	10 days before planting at soil temperature 50°F or above. May also be applied in fall to prepare soil for early spring planting.
Hawthorn	Leaf blight	Cycloheximide 5 (380 mg) tablets; Captan, 2 lb; Benomyl, ½ lb; Mancozeb, 2 lb	Apply at bud break and thereafter as needed to maintain control.
Hawthorne, Crab apple, etc.	Rusts	Ferbam 2 lbs (75%); Zineb 1½-2 lbs (75%) Mancozeb 1½-2 lbs	3-4 sprays starting when flower buds open or when orange rust masses appear on juniper.
Honeysuckle	Leaf blight	Mancozeb 1½ lb (80%)	Apply, starting in May, at 7-10 day intervals as needed to maintain control.
Horse chestnut, Buckeye	Leaf blotch	Zineb, 1½ lb (75%); Mancozeb, 1½ lb	Apply 3 times, at bud swelling, bud break, and 10 days later.
Juniper	Twig blight	Benomyl, ½-1 lb (apply with spreader-sticker)	Apply 2-3 sprays. Start when new growth appears. Prune out severely diseased tissues.

continued

1. Disease Control for Trees and Shrubs (cont'd)

Host	Disease	Material per 100 gallon water	Comments
Juniper	Rusts (spring)	Cycloheximide 50 (380 mg) tablets or 3 lb (0.0027%) or 2 T/gal; Zineb, 2 lb; Mancozeb, 2 lb	Apply as soon as orange rusts masses appear in spring to destroy spore masses. Prune out galls before spore discharge.
Juniper	Rust (fall)	Ferbam, 2 lb; Mancozeb, 2 lb	First application when apple, hawthorn, etc. rust spots mature. Repeat twice at 21-day intervals.
Maple, Willow	Tar spot	Zineb, 2 lb; Captan, 2 lb; Ferbam, 2 lb; Bordeaux, 8-8-100; or Mancozeb 2 lb	1-2 sprays at 14 days, at and following bud break. Destroy diseased leaves in fall.
Oak	Leaf blister	Bordeaux (4-3-100); Lime sulfur (liquid) 8 gal	Apply while trees are dormant.
Ornamentals (general)	Powdery mildew	Benomyl, ½ lb; Dinocap, ½ lb, Wettable sulfur, 2 lb; Acti-dione PM, 6¼ lb	Apply at first sign of disease and thereafter as needed.
Pine	Needlecast	Maneb, 2½ lb; Chlorothalonil, 2½ lb (75%), or 3⅓ pt (54%)	2 sprays if light; 3 sprays if heavy infection. Apply Aug 1 and Sept 1; or July 25, Aug 15, Sept 10.
Pine, Spruce Douglas fir	Tip blight	Fixed copper (50%), 4 lb; Bordeaux mixture 8-8-100	Apply first spray at bud swell stage and second 10 days later.
Pine and fir species	Seed decay Seed blight	TBZ slurry, 0.5 fl oz in 1.33 qt water; TBZ 3 lb/acre	Allow seeds and material to dry before planting.
Spruce	Needlecast	Bordeaux 8-8-100	First application June 5-10 and again 21 days later.
Sycamore	Anthracnose	Dodine, 1½ lb; Zineb, 2 lb; Mancozeb, 2 lb; Bordeaux, 4-4-100*	Apply 1 to 3 sprays at bud break and at 10-day intervals if average temperature remains below 55°F. Recommended for young trees only.
Walnut	Leafspot	Zineb, 2 lb; Benomyl, ½ lb; Maneb, 2 lb; Dodine, ½ lb; Mancozeb, 2 lb	Make 3 applications starting at bud break, then 10 days later and again when leaves are fully developed.
All ornamentals	Fungus wound rots	Thiram 1% paint as wound dressing. Bordeaux mixture plus linseed oil (nomenclade)	Apply as a thick paint.

**4-4-100 or 8-8-100 indicates lb of copper sulfate-lb of lime-gal of water.*

CONVERSION TABLE FOR SMALL GALLONAGE AMOUNTS FOR FUNGICIDES LISTED ABOVE

CHEMICAL	Material per 100 gal	Material per gal equivalent
Benomyl 50%	1 lb.	1 Tbsp.
Bordeaux	1-1-100	⅓ Tbsp.-1 Tbsp.-1 gal.
Captan 50%	1 lb.	1 Tbsp.
Chlorothalonil 54%	3⅓ pts.	1 Tbsp.
Copper sulfate 100%	1 lb.	1 tsp.
Cycloheximide	3 lb. 2 oz. (0.027%) = 1ppm	2 Tbsp.
Dichlone 50%	1 lb.	2 tsp.
Dinocap 48% E.C.	4 fl. oz.	2 tsp./3 gal.

CHEMICAL	Material per 100 gal	Material per gal equivalent
Dodine 65%	1 lb.	2 tsp.
Ferbam 75%	1 lb.	1¼ Tbsp.
Folpet 50%	2 lbs.	2 Tbsp.
Maneb 80%	1 lb.	½ Tbsp.
Streptomycin	½ lbs./100 = 100 ppm	
Sulfur (wettable)	1 lb.	½ Tbsp.
Thiram 95%	1 lb	¾ Tbsp.
Zinc-ion maneb 80%-(Mancozeb)	2 lbs.	1½ Tbsp.
Zineb 75%	2 lbs.	1½ Tbsp.

2. Disease Control for Turfgrasses

Prepared By J. M. Vargas, Jr.

Disease	Host	Cultural Control	Chemical Control
Brown patch *(Rhizoctonia solani)*	Bentgrass, bluegrass (July-Aug)	Avoid high nitrogen fertilizers. Increase air circulation.	Daconil 2787, Dyrene, Acti-dione Thiram, Tersan LSR, Fore, Proturf Fung. III.
Dollar Spot *(Sclerotinia homeocarpa)*	Bentgrass, bluegrass, fescue (May-Nov)	Increase nitrogen. Remove dew (Guttation).	Daconil 2787, Proturf DSB, Tersan 1991, Dyrene, Acti-dione Thiram, Cleary's 3336, Fungo, Spot-Kleen, Bromosan.
Fairy ring (Many *Basisiomycetes*)	All turf areas (April-Nov)	Removal of infested sod and soil and replacing with clean soil and reseed or sod.	Soil Fumigants: Methyl bromide, Chloropicrin, Vapam, Vorlex.
Fusarium blight, Nematodes (*Tylenchorhynchus dubius* + *Criconemoides* spp) Interacting with *Fusarium roseum* and *F. tricinctum*	All grasses, most commonly found on Kentucky bluegrass (May-Oct)	Light frequent waterings during periods. Fungicides MUST be drenched to be effective. Avoid heavy nitrogen fertility in the Spring.	Tersan 1991, Spot Kleen, Fungo, Cleary's 3336.
Fusarium patch (Pink snow mold) *Fusarium nivale*	Bentgrass, bluegrass, fescue (Sept-May)	Avoid fall nitrogen fertilization that leads to lush growth.	Tersan 1991, Fore, Fungo, Cleary's 3336, Spot Kleen.
Melting Out, Fading Out, Leaf Spot (*Helminthosporium* spp)	Bentgrass, bluegrass, fescue (April-Nov)	Remove clippings. Raise cutting height. Resistant Kentucky bluegrass cultivars: A-20, Baron, majectic, Adelphi, Touchdown, parade, Cheri.	Fore, Daconil 2787, Acti-dione, Thiram, Dyrene, Tersan LSR, Proturf F + F II.
Powdery mildew *(Erysiphe graminis)*	Kentucky bluegrass, (shaded areas) (July-Nov)	Reduce shade. Resistant cultivars. Nuggett, Warren's A-34.	Tersan 1991.
Pythium blight *(Pythium* spp.)	Bentgrass, bluegrass, ryegrass (July-Aug)	Improve soil drainage. Increase air circulation.	Tersan SP, Koban, Proturf Fung. II.
Red thread *(Corticium fuciforme)*	All grasses but mostly fescues. Manhattan rye grass (Sept-Nov)	Increased nitrogen.	Daconil 2787, Fungo, Cleary's 3336.
Stripe smut *(Ustilago striiformis)*	Bluegrass, Kentucky bluegrass (mostly Merion and Windsor) (April-Nov)	Blends of resistant cultivars. Fungicide MUST be drenched and applied while turf is dormant. *Helminthosporium* control is also needed.	Tersan 1991, Spot Kleen. Fungo, Cleary's 3336.
Typhula blight (Gray Snow mold) *(Typhula itoana)*	Bentgrass, bluegrass (Under snow)	Avoid fall nitrogen fertilization that leads to lush growth.	Calo Clor, Calo Gran.

*Unless specified, Bluegrass refers to both annual bluegrass (*Poa annua*) and Kentucky bluegrass (*P. pratensis*).

Note: See small gallonage conversion table on page 2.

3. Insect Control for Trees, Shrubs and Flowers

(For specifics on the above insects on Christmas trees, check MSU Bulletin E-353.)

For specific insect and mite control for homeowners, refer to MSU Bulletin E-534, "Controlling Pests of Trees and Shrubs."

Prepared By Gurdon Dennis

Insect	Control Materials
Aphids: Free living aphids, gall aphids	Malathion, Diazinon, Cygon, Meta-systox R, or Orthene Lindane, Thiodan, or Meta Systox-R
Bagworm	Sevin, Dursban, Diazinon, Malathion, Dylox, Orthene, Dipel or Thuricide
Black vine weevil	Chlordane (June-July)
Borers	Lindane, Thiodan, or Dursban
Box elder bug	Sevin, Cygon, Lindane, or Malathion
Defoliators, e.g. Cankerworm, Elm Leaf Beetle, Fall Webworm, Tent Caterpillars	Sevin, Cylox, Diazinon, Orthene, Dipel, Thuricide, Dursban or Imidan
Lace bug	Sevin, Guthion, or Orthene
Miners: Soil Treatment, Foliage Treatment	 Di-syston (Leaf Miner only—in soil beneath tree) Malathion, Sevin, Cygon, Meat-Systox R, Orthene, Diazinon or Imidan
Mites	Morestan, Tedion, Kelthane
Scale: Dormant, Crawler	 Dormant Oils (60-70 sec), Liquid Lime Sulfur, or Ethion and Oil Malathion, Cygon, Diazinon, Sevin, or Guthion
Mealybugs	Malathion, Dursban, Orthene, or Dormant Oil
Millipede, Pillbugs	Diazinon

4. Insect Control for Turfgrasses

Prepared By Gurdon Dennis

Insect	Control Materials
Turf insects (See label for specific insects.)	*To treat 5,000 sq ft:* 10 fl oz 22% Dursban emulsion or 2 qt 25% Diazinon emulsion or 4 qt 50% Sevin wettable powder or 2½ pt Ethion 4E or 1 lb 80% Dylox soluble powder or 2¾ oz 70% Beygon wettable powder *For sod webworm*—2% Diazinon, or ½% Dursban granules will give good control. Apply according to label instructions.

5. Mosquito Control

Prepared By Don Newson

Operation	Material Rate and Notes
For Mist Blowers—Adult:	Malathion, 57% Emulsion. 2 gal/98 gal water. Apply 60 to 100 gal/hr on swath width of 200 ft at vehicle speed 3-5 mph.
	Baytex (Fenthion) 45% Emulsion. Mix 2⅛ to 4¼ gal of concentrate/100 gal water. Apply at 100 gal/hour, traveling at 4 mph, swath width up to 350 ft. Allow at least 3 weeks between applications.
	Dibrom 8 (Naled). See lable.
	Dursban. See label.
*For Thermal Fogge. —Adult:	Malathion, 95% Concentrate.† Mix 2.6 gal concentrate/100 gal fogging solution.
	Baytex (Fenthion) 45% Concentrate. Mix 1-2 gal concentrate/100 gal fogging solution.
	Dibrom 14 (Naled).† Mix 3.1 qt concentrate/100 gal fogging solution.
*For Ground Ultra-Low Volume Applications—Adult:	Malathion ULV Concentrate. See label.
	Baytex (Fenthion) Liquid Concentrate. See label.
	Dibrom 14 (Naled) Concentrate. See label.
	Dursban Mosquito Fogging Concentrate. See label.
Larvicide	Abate—4E. 0.5-1.5 oz/acre. Repeat application as neccessary. Don't use on crops used for food, forage or pasture.
	Dursban—2E, granules, or 10 CR Follow lable. May cause problems with fish.

Thermal fogging mixtures should be applied at the rate of 40 gal/hr at a machine speed of 5 mph, swath width up to 300 ft.

**Thermal fogs and ground ultra-low volume applications are effective only as contact insecticides so should be used only from evening to early morning and be timed to coincide with the greatest mosquito activity. For maximum efficiency weather conditions should be such that the insecticide will remain close to the ground and the wind velocity should not exceed 4 miles/hour.*

†This insecticide may require the use of special additive to prevent the formation of a sludge-like precipitate when mixed with No. 2 fuel oil, diesel oil or other kerosene-type oil suitable for insecticide use. Consult dealer for specific recommendations.

8

6. Nematode Control

Prepared By George W. Bird

In addition to nematode control through use of soil fumigants or nematicides, it is important to prevent occurrence of nematode problems through use of good horticultural practices and production of high quality stock grown and maintained in nematode-free, fumigated or nematicide-treated soil.

The soil fumigants and nematicides listed below are not registered for use on all ornamentals.

Material	Rate	Limitations, Directions
	Preplant Soil Treatment	
DBCP (Nemagon, fumazone)†	2-4 gal/acre broadcast, or ¾ to 1½ oz/100 linear ft	Do not use on carnations, lilies, or amaryllis. Wait at least 14 days after application for planting. See tolerant species listed on page 9.†
1, 3-D (D-D, Telone II)	15-20 gal/acre broadcast, or 8 oz/100 linear ft	Wait at least 21 days after application before planting.
1, 3-D + Chloropicrin (Terr-o-cide-30-D, Terr-o-cide 15-D, DD-Pic, Telone C	20 gal/acre broadcast, or 8 oz/100 linear ft	Wait at least 21 days after application before planting.
EDB (Dowfume W-40, Soilbrom-40)	18 gal/acre broadcast, or 7 oz/100 linear ft	Do not use on soil to be used for growing lilies, or amaryllis. Wait at least 21 days after application before planting.
(Dowfume W-85, Soilbrom-85)	6 gal/acre broadcast, or 3 oz/100 linear ft	Do not use one soil to be used for growing lilies, or amaryllis. Wait at least 21 days after application before planting.
EDB + Chloropicrin (Terr-o-cide-30, Terr-o-cide-15)	15 gal/acre broadcast, or 4 oz/100 linear ft	Wait at least 21 days after application before planting. See other limitations for EDB.
Methyl Bromide and Chloropicrin (Dowfume MC-2, Brom-O-Gas)	2 lb/100 sq ft	Commercial use only. Apply under a plastic cover, removing cover 48 hr before seeding or 4 days prior to transplanting. Do not use on soil to be planted to bromine sensitive plants. Effective against many weed seeds, soil fungi, insects, and bacteria as well as nematodes.
MIC (Vorlex)	25-50 gal/acre broadcast, or 15 oz/100 sq ft	Wait at least 21 days after application before planting. High rates are effective against soil fungi and some weeds as well as nematodes.
Oxamyl (Vydate L)*	3-10 gal/acre in a minimum of 20 gal water	**For professional application only and for use only in commercial plantings.** Thoroughly incorporate to a depth of 4-8 in immediately after application.*
VPM (Vapam)	32 oz/100 sq ft	Wait at least 14 days after application before planting. Tarp treated area for best results. Effective against some weed seeds & soil fungi, as well as nematodes.
	Preplant Root Dips	
Oxamyl (Vydate L)*	2-4 pt/100 gal water (1½ T/5 gal)	**Root, corm or bulb dip. For professional application only. For use only in commercial operations.** Place plant material in solution for 1 to 30 minutes. Use higher rates and longer soaking times for more severe nematode infestation.*
	At Planting or Post Planting Nematicides	
Aldicarb (Temik 10G)	50-60 lb/12,000 linear ft of row. 4-6 lb/1,000 linear ft of row.	For control of nematodes associated with bulbs. **For professional application only. For use only in commercial operations.** Registered for use as a nematicide only on lilies and bulbs.
DBCP E.C. (Nemagon, Fumazone)†	Broadcast: 2-4 gal or ¾ to 1½ oz/100 linear ft	Do not use on sensitive plants. See tolerant species listed on page 9.†

††, see footnotes on page 9

continued

*Registered only for azalea, bird's nest fern, boxwood, chrysanthemum, croton, dieffenbachia, picta, dracaena, gardenia, gladiolus, Hindu rope, leather leaf fern, maranta, peony, peperomia, philodendron, rose, sansevieria and snapdragon.

6. Nematode Control (cont'd)

Material	Rate	Limitations, Directions
Fensulfothion‡ (Dasanit 15G)	1 lb actual/1,000 sq ft 6.7 lb of 15% G	**Treatment of beds and benches.** Apply dosage evenly over area and work thoroughly into soil 4-6 in. Do not apply to newly seeded areas. **For commercial use only. Must be applied by a professional applicator.** See recommended plants listed below.‡
	0.03 oz actual/ft³	**Potting soil.** Mix material thoroughly with soil. do not treat peony, begonia, hydrangea, and *Aucuba* spp. do not use in or near human dwellings. **For commercial use only. Must be applied by a professional applicator.** See recommended plants listed below.‡
Oxamyl (Vydate L)*	Soil mix treatment: 2¾ oz/10 gal water	Spray 2½ to 10 gal of the dilute mix onto one cubic yard of soil while tumbling in a soil mixer. **For professional application only. for use only in commercial operations.**
	Foliar treatment: 2-8 pt/100 gal water	Spray on foliage to run-off. Make 4 applications on 2 to 3 week schedule. **For professional use only. for use only in commercial operations.**
	Liquid drench: 1 pt/100 gal water	Apply drench at rate of 4-8 oz/6 in pot., or 2-4 oz/4 in pot. **For professional application only. for use only in commercial operations.**

*see footnote, page 8.

†Can be used preplant, at planting or postplant and can be applied either by chisel injection or in irrigation water.

TOLERANT SPECIES: *Acanthopanax pentaphyllus*, African violet, aglaoema, ajuga, amaryllis, anchusa, Andromeda, apple, *Ardisia japonica*, *Aronia arbutifolia* (chokeberry), arrowwood, asclepias, asparagus fern, astilbe, azalea, barberry (red leaf and dwarf), *Buxus harlandi* (boxwood), *Buxus japonica*, *buxus sempervirens arborescens*, *Buxus sempervirens suffruticosa*, calanthea, *Callistemon rigidus* (bottle brush), caryopteris, centranthus, cherry (Mahaleb root stock), columbine, coreopsis, *Cotoneaster divaricata*, crab apple, crepemyrtle, purple; croft lily, cryptantha, daisy, deutzia, *Dianthus grenadin*, dicentra, dieffenbachia, dogwood, dracaena, elder, elm, euonymus vegetus, exochorda, fatshedera, fiethorn, forget-me-not, funkia, gypsophila, heliopsis, helleborus, hemlock, hibiscus, holly, hypericum, *Ilex crenata convexa*, *Ilex rotundifolia*, incarvillea, lavandula, ligustrum (privet), Lily of the valley, locust (seedlings), lonicera (honeysuckle), macrophylum, maple, red; maranta, mountain ash, nephthytis, oak, live; oak, northern red; oak, white; pachysandra, pansy, peach, pear, peony, peperomia, periwinkle, philadelphus (mockorange), philodendron, *Physocarpus opulifolius aureus*, pilea, pine, Japanese black; pine, white; pittosporum, plum, pothos, potentilla, podocarpus, pyrethrum (seed), rudbeckia, *Salix discolor* (pussywillow), *Salix purpurea nana*, sansevieria, schefflera, sedum, spirea, *symphoricarpos albus* (common snowberry), sweet pea (perennial), syringa (lilac), *Tamarix africana*, thuja (arborvitae), tritoma, violet, *Vitex angus Castus latifolia*, weigela, yew, Japanese; zinnia.

MODERATELY TOLERANT SPECIES: artemisia, blueberry, camellia japonica, (var. pink Perfection and var. Elixabeth), Camellia sasanqua (var. Shell Pink), campanula, chrysanthemum, delphinium, echinops, forsythia, *Gardenia fortuniana* (var. Mystery), *Gardenia jasminoides* (var. Florida and var. August Beauty), *Gardenia radicans*, geum, gladiolus, lythrum, *Magnolia grandiflora*, *Magnolia soulangeana*, phlox, Pine, Austrian; Pine, slash; *Polygonum distortum*, *Pyrethrum* (plants), *Rosa fortuneana* (var. Happiness Rose), *Rosa* sp. (var. Jiminy Cricket, var. Dr. Huey, var. Contessa Vandal, var. Isobel Harkness); stantolina, *Taxus cuspidata compacta*, *Taxus cuspidata thayeriae*, *Taxus media andersonii*, *Taxus media hatfieldii*, *Taxus media hicksii*, *Tsuga canadensis* (hemlock), and vinca (periwinkle).

‡Registered for use as a nematicide on FLOWERING SHRUBS: azalea, blue mist camellia, Chinese hibiscus, gardenia, honeysuckle, jasmine, jungleflame, metrosideros, pyracantha, Surinam cherry, roses and viburnum. PERENNIAL FLOWERS: aloe, butterfly iris, century plant, chrysanthemum, cyclamen, Easter lily, gladiolus and gloxinia. VINES: Bougainvillae. OTHER SHRUBS: ardisia, boxwood, croton, dwarf yaupon, euonymus, eurya, gallberry, holly, holly leaf osmanthus, Japanese yew, juniper, privet, natal plum, red leaf barberry and yew.

7. Weed Control for Ornamentals

Prepared By Alan R. Putnam

Always check the label for ornamental species that will tolerate each herbicide

Problem	Material	Amount/A	Amount/ 1,000 sq ft	Time of Application and comments
		Transplanted Flowers and Ground Covers		
Annual weeds	Eptam 7-E Eptam 2.3G	5¾ pt	4 T 5 lb	Apply to soil prior to transplanting and rototill into soil to a depth of 2-3 in. Granules may also be raked or water in. Granules can be applied after transplanting but must be applied before the weeds come up.
	Treflan 4EC Treflan 5G	1-2 pt 10-20 lb	¾-1½ T 3½-7 oz	Apply to soil prior to transplanting and rototill into soil to a depth of 2-3 in. Granules may also be raked or watered in. Granules can be applied after transplanting but must be applied before the weeds come up. Use the lower rate on sandy soils and the higher rate on clay loam soils.
	Enide 50W	8-12 lb	3-4½ oz	Apply to the soil surface after transplanting. Irrigation after spraying will increase the effectiveness of the herbicide. Use the lower rate on sandy soils and the higher rate on clay loam soils.
	Dacthal 75W Dacthal 5G	14-16 lb	2-5 oz 3-¾-7 lb	Apply to the soil surface after transplanting. Irrigation after spraying will increase the effectiveness of the herbicide. Use the lower rate on sandy soils and the higher rate on clay loam soils.
Quackgrass (prior to planting)	Amitrol-T or Cytrol-Amitrol-T	4 qt	6 T	Apply to actively growing quackgrass. Plow and disk about 10 days after spraying. Wait a minimum of six weeks to plant flowers or ground covers.
		Newly Planted Nursery Stock (Liners)		
Annual weeds	Treflan 4EC Treflan 5G	1-2 pt 10-20 lb	¾-1½ T 3½-7 oz	Apply to the soil prior to transplanting and rototill into the soil to a depth of 2-3 in. Granules may also be raked or watered in. Granules can be applied after transplanting, but should be applied before the weeds come up.
	Casoron W50 Casoron 4G	8-12 lb 100-150 lb	3-4½ oz 2½-3½ lb	Granular formulation is preferred unless the chemical is incorporated or irrigated in. Do not use until 4 weeks after transplanting. Use the lower rate on sandy soils and the higher rate on clay loam soils.
	Enide 50W	8-12 lb	3-4½ oz	Apply to the soil surface after transplanting. Irrigation after spraying will increase the effectiveness of the herbicide. Use the lower rate on sandy soils and the higher rate on clay loam soils.
Quackgrass (prior to planting)	Amitrol-T or Cytrol-Amitrole-T	4 qt	6 T	Apply to actively growing quackgrass. Plow and disk about 10 days after spraying. Wait a minimum of six weeks to plant nursery stock.
		Established* Nursery Stock		
Annual weeds	Princep 80W Princep 4G	2½-3¾ lb 50-75 lb	1¼-1¾ oz 18-27 oz	In fall or spring before weeds emerge. Use the lower rate on sandy soils and the higher rate on clay loam soils.
	Treflan 4EC Treflan 5G	1-2 pt 10-20 lb	¾-1½ T 3½-7 oz	Should be incorporated with a cultivator or rototiller or irrigated in after application. Use the lower rate on sandy soils and the higher rate on clay loam soils.
	Enide 50W	8-12 lb	3-4½ oz	Irrigation after spraying will increase the effectiveness of the herbicide. Use the lower rate on sandy soils and the higher rate on clay loam soils.

continued

**Plants that are in the field at least a year.*

7. Weed Control for Ornamentals

Problem	Material	Amount/A	Amount/ 1,000 sq ft	Time of Application and comments
Quackgrass and annual weeds	Casoron 4G	100-150 lb	2¼-3½ lb	Apply in November prior to snowfall for quackgrass control. Use the lower rate on sandy soils and the higer rate on clay loam soils.
	Kerb 50W	2-4 lb	¾-1½ oz	Use the higher rate for quackgrass control. Apply in November prior to snowfall.
	Princep 80W and Kerb 50W	2½ lb and 4 lb	1¼ oz and 1½ oz	Apply in November prior to snowfall. This treatment will control quackgrass and annual weeds around species that are sensitive to higher rates of Princep.
		Under Established† Ornamental Trees		
Quackgrass, annuals and perennials	Amizine or Princep 80W and Cytrol Amitrol-T	7 lb 4 lb and 4 qt	2½ oz 1½ oz and 6 T	Apply when weeds are 6-8 inches high. Do not allow the spray to touch the foliage of trees.
	Princep 80W and Paraquat CL	2½ lb and 1 qt	1.2 oz and 1½ T	Apply when weeds are 6-8 inches high. Do not allow the spray to touch the foliage of trees. Add a wetting agent at 8 oz/100 gal spray.
	Casoron 50W Casoron 4G	12 lb 150 lb	4½ oz 3½ lb	Apply in the fall or early spring and cover with an organic mulching material such as wood chips. The herbicide may also be pre-mixed with mulch and applied under trees. This is particularly effective for sloping sites and highway plantings.
	Princep 80W and Kerb 50W	2½ lb and 4 lb	1¼ oz and 1½ oz	Apply in November prior to snowfall. This treatment will control quackgrass and annual weeds around species that are sensitive to higher rates of Princep.

†Established in the field at least one year.

8. Weed Control for Roadsides and Ditches

Prepared By William Meggitt

Problem	Material	Amount/A	Comments
		Roadside	
Brush	2, 4-D plus 2, 4, 5-T	½-2 gal/A formulation (Use 2-4 lb/A actual)	Cannot be used around water or on cropland areas.
		Ditches	
Cattails	Dowpon (Dalapon) Amitrol-T (Amitrole)	15 lb 2 lb	
Broadleaf weeds	2, 4-D	4 lb	

9. Weed Control in Turf

Problem	Material	Comments
Dandelion, Plantain	2, 4-D Amine	Spring, Fall
Chickweed, Henbit and other hard-to-kill broadleaves	2, 4-D + 2, 4, 5-TF (Silvex)	Early Spring or Fall

General Vegetation Control

(Industrial sites, substations, fuel holding yards, etc.)

Amizine (Amitrole + Simazine)	10 lb	Fenavar (Amitrole + Bromacil + Fenac)	3-10 lb	Hyvar X-L (Bromacil)	4-12 lb	Pramitol (Prometone)	10-100 lb

Pounds active ingredients per acre. Use lower rates for control of annual weeds and higher rates for deep rooted perennials.

10. Aquatic Pest Control

Prepared By Ray J. White

Algae	
Planktonic	Copper sulfate,* Chelated copper, Salt of Endothall (liquid), Simazine or Aquazine†
Filamentous	Copper sulfate,* Chelated copper, Salt of Endothall (liquid), Salt of Endothall (granular), Diquat, Simazine or Aquazine†
Chara, Nitella	Copper sulfate,* Chelated copper, Salt of Endothall (liquid), Salt of Endothall (granular), Simazine or Aquazine†
Submergent macrophytes	
Curly-leaf pondweed	Salt of Endothall (granular), Endothall, Diquat, Simazine or Aquazine†
Sago pondweed	Salt of Endothall (granular), Endothall, Diquat, Simazine or Aquazine†
Large-leaf pondweed	Salt of Endothall (granular), Endothall, Diquat, Simazine or Aquazine†
Naiad	Salt of Endothall (granular), Endothall, Diquat, 2, 4-D, Simazine or Aquazine†
Water buttercup	Diquat
Coontail	Salt of Endothall (granular), Endothall, Diquat, 2, 4-D, Simazine or Aquazine†
Milfoil	Salt of Endothall (granular), Endothall, Diquat, 2, 4-D, Simazine or Aquazine†
Elodea	Salt of Endothall (granular), Diquat
Wild celery	Salt of Endothall (granular)
Emergent macrophytes	
Water lily	2, 4-D
Arrow weed	2, 4-D
Cattail	Diquat, 2, 4-D
Bulrush	2, 4-D
Free-floating macrophytes	
Duckweed	Diquat

Details on application rates and timing will be found on the product label. Follow label instructions carefully. *A DNR permit will be necessary* for application of any chemical to any body of water which is not entirely private, that is, which has public access or which is connected in *any* manner with a lake, pond or stream that has public access (or the shoreline of which is owned by more than one party). The DNR permit is a necessary formality and it is used as a means of recording usage and of screening out mistakes. Few applications are refused. Applicants may receive useful advice in the process. Failure to get a permit may result in penalty. Permits can be obtained via DNR district offices. Allow plenty of time for processing of the permits—several weeks at least.

The most effective time in general for application will be late spring or early summer, when the plants are in a stage of rapid new growth. **For Chara**, chemicals may be effective only during very early growth when the plants are tender and clean. Later, the plants tend to develop a crust of lime which interferes with the action of toxic chemicals.

NOTE: Herbicides are **only one** kind of control for aquatic plants. Mechanical controls are available, such as simply raking the plants out of the water. The only long-lasting control of water plants is to deprive them of nutrients. Other methods include the use of non-herbicidal chemicals to precipitate nutrients out of the water.

*Not recommended for fish ponds, as concentrations of copper sulfate heavy enough to kill the algae will probably be injurious to pond life—including fish and fish food organisms. Chelated copper will control algae while introducing much less toxic copper.

†*In ponds only*—not in lakes or streams or in waters connecting with them.